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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/519,672	03/06/2000	Toshihiko Ouchi	35.G2544	8718

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EXAMINER
THOMAS, COURTNEY D

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/519,672	OUCHI ET AL.	
	Examiner	Art Unit	
	Courtney Thomas	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *81-99* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *81-99* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. The indicated allowability of claims 86, 87, 88 and 97 are withdrawn in view of the newly discovered reference(s) to Ohta et al. (U.S. Patent 5,294,790) and Akamine et al. (U.S. Patent 5,489,774). Rejections based on the newly cited reference(s) follow.

Claim Objections

2. Claims 86 and 87 are objected to because of the following informalities: Claims 86 and 87, both dependent on claim 81, recite the presence of (said) elastic supporter. Examiner notes that claim 81 does not recite this limitation. Additionally, Examiner contends that the claims (86 and 87) appear to be drawn to a method of forming a device substrate, whereas the preamble of the claim relates to an apparatus. It is therefore unclear what applicants consider being their invention. Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 81 and 82 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohta et al. (U.S. Patent 5,294,790).

3. As per claim 81, Ohta et al disclose an apparatus comprising a surface light emitting device (Fig. 1), a substrate (Fig. 1, #101) for supporting the surface emitting device; wherein the surface light emitting device includes a protrusion with an opening (Fig. 1, # 110).

4. As per claim 82, Ohta et al. disclose an apparatus wherein evanescent light leaks from the opening (column 4, lines 44-46).

5. Claims 93-95 are rejected under 35 U.S.C. 102(b) as being anticipated by Quate et al. (U.S. Patent 5,666,190).

6. As per claim 93, Quate et al. disclose an apparatus comprising an elastic supporter (Fig. 1, #20; column 4, lines 10-14) and a surface-emitting device on the elastic supporter (Fig. 1, #25; column 4, lines 18-20).

7. As per claim 94, Quate et al. disclose an apparatus wherein the elastic supporter is shaped into a cantilever (Fig. 1, #20; column 4, lines 10-14).

8. As per claim 95, Quate et al. disclose an apparatus wherein the elastic supporter is shaped as a trapezoidal cantilever whose central portion is removed (Fig. 13W1).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (U.S. Patent 5,294,790) in view of Applicant's admitted prior art (admission).

11. As per claim 83, Ohta et al do not explicitly disclose an apparatus wherein the opening (of the protrusion) is less than 100 nm.

12. Admission teaches the development of optical techniques using evanescent light from a minute opening of less than 100 nm formed at a sharp probe tip (Background of the invention, p. 1, lines 14-16).

13. It would have been obvious to modify the apparatus of Ohta et al. such that it incorporated an opening of less than 100 nm. One would have been motivated to make such a modification for the purpose of obtaining high-resolving power observation, high density information recording, super fine optical exposure and the like as taught by applicant's admission (Background of the invention, p. 1, lines 16-19).

14. Claim 84 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (U.S. Patent 5,294,790).

15. As per claim 84, Ohta et al. do not explicitly disclose an apparatus wherein the shape of the protrusion is a quadrangle pyramid.

16. Ohta et al. disclose a protrusion having a conical shape, terminating at an apex (see Fig. 1, # 110).

17. It would have been obvious to modify the apparatus of Ohta et al. such that it incorporated a quadrangle pyramid protrusion. One would have been motivated to make such a modification for the purpose of limiting the diameter of the light emitted from the protrusion opening as taught by Ohta et al. (column 4, lines 44-46). Examiner additionally notes that the protrusion of Ohta et al. would be recognized as a functional equivalent to a quadrangle pyramid protrusion.

18. As per claims 86 and 87, Ohta et al. disclose a substrate comprising silicon and corresponding thin films (column 4, lines 28- 29). Ohta et al. do not explicitly disclose an apparatus comprising patterned layers of silicon compounds, including silicon nitride.

19. It would have been obvious to modify the apparatus of Ohta et al. such that it comprised a silicon substrate and patterned layers of silicon compounds including silicon nitride. One would have been motivated to make such a modification so that the resulting substrate is provided with sufficient insulation to prevent the unwanted flow of charge on the supporting structure, while also providing mechanical strength for the mounting of optical components.

20. Claim 85 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (U.S. Patent 5,294,790) in view of Quate et al. (U.S. Patent 5,666,190).

21. As per claim 85, Ohta et al. do not explicitly disclose an apparatus wherein the surface-emitting device is supported by a substrate through an elastic supporter.

22. Quate et al. disclose an apparatus wherein the surface-emitting device is supported by a substrate through an elastic supporter (Fig. 1, #20; column 4, lines 10-14).

23. It would have been obvious to modify the apparatus of Quate et al. such that it incorporated an elastic supporter for the surface-emitting device. One would have been motivated to make such a modification for the purpose of enabling a probe tip to be responsive to forces that cause vibrations, so a system could use the information to adjust the gap between the tip and the surface of interest as taught by Quate et al. (column 2, lines 17-20).

24. Claim 88 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (U.S. Patent 5,294,790) in view of Akamine et al. (U.S. Patent 5,489,774).

25. As per claim 88, Ohta et al. do not disclose an apparatus further comprising a photo detector.

26. Akamine et al. disclose an apparatus comprising a photo detector (**132**). Akamine et al. teach the inclusion of a photo detector for detecting the presence of evanescent light generated at the surface of a sample (abstract; column 2, lines 40-42).

27. It would have been obvious to modify the apparatus of Ohta et al. such that it incorporated a photo detector. One would have been motivated to make such a modification so that evanescent light is easily detected near the surface of a sample as taught by Akamine et al. (abstract; column 2, lines 40-42).

28. Claim 89 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (U.S. Patent 5,294,790) further in view of Fillard et al. (U.S. Patent 5,770,856).

29. As per claim 89, Ohta et al. do not explicitly disclose an apparatus wherein the surface-emitting device comprises a surface emitting semiconductor laser.

30. Fillard et al. disclose an apparatus comprising a surface emitting semiconductor laser (column 10, lines 26-25).

31. It would have been obvious to modify the apparatus of Ohta et al. such that it incorporated a surface-emitting laser. One would have been motivated to make such a modification for the purpose of configuring an apparatus for use in signal communication systems or programmable arrays of optical memories due to their nano-structure configuration as taught by Fillard et al. (column 10, lines 26-25).

32. Claims 90-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (U.S. Patent 5,294,790) and Fillard et al. (U.S. Patent 5,770,856) in view of Jain (U.S. Patent 5,212,706) and Watanabe et al. (U.S. Patent 5,825,789).

33. As per claims 90-92, Ohta et al. do not explicitly disclose an apparatus wherein the surface emitting laser comprises layers of GaAs, AlGaAs, InGaAs and GaN.

34. Jain discloses a surface-emitting laser comprising layers of GaAs, AlGaAs, InGaAs (see Fig. 1).

35. Watanabe et al. disclose a surface-emitting laser comprising layers of GaN, AlGaAs, InGaAs (column 2, lines 7-11).

36. It would have been obvious to further modify the apparatus of Ohta et al., such that it incorporated layers of GaAs, AlGaAs, InGaAs and GaN. One would have been motivated to make such a modification for the purpose of employing assemblies to provide multiple laser beam outputs as taught by Jain (column 1, lines 7-10). Additionally, Watanabe et al. teach that GaN is desirable as a layer because its rigidity is comparable to that of diamond (column 6, lines 6-8) and is therefore suitable as a support layer.

37. Claim 96 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quate et al. (U.S. Patent 5,666,190) in view of Fillard et al. (U.S. Patent 5,770,856).

38. As per claim 96, Quate et al. do not explicitly disclose an apparatus wherein the surface-emitting device comprises a surface emitting semiconductor laser.

39. Fillard et al. disclose an apparatus comprising a surface emitting semiconductor laser (column 10, lines 26-25).

40. It would have been obvious to modify the apparatus of Quate et al. such that it incorporated a surface-emitting laser. One would have been motivated to make such a modification for the purpose of configuring an apparatus for use in signal communication systems or programmable arrays of optical memories due to their nano-structure configuration as taught by Fillard et al. (column 10, lines 26-25).

41. Claim 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quate et al. (U.S. Patent 5,666,190) in view of Akamine et al. (U.S. Patent 5,489,774).

42. As per claim 97, Ohta et al. do not disclose an apparatus further comprising a photo detector.

43. Akamine et al. disclose an apparatus comprising a photo detector (**132**). Akamine et al. teach the inclusion of a photo detector for detecting the presence of evanescent light generated at the surface of a sample (abstract; column 2, lines 40-42).

44. It would have been obvious to modify the apparatus of Quate et al. such that it incorporated a photo detector. One would have been motivated to make such a modification so that evanescent light is easily detected near the surface of a sample as taught by Akamine et al. (abstract; column 2, lines 40-42).

45. Claims 98 and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quate et al. (U.S. Patent 5,666,190) and Fillard et al. (U.S. Patent 5,770,856) in view of Jain (U.S. Patent 5,212,706) and Watanabe et al. (U.S. Patent 5,825,789).

46. As per claims 98 and 99, Quate et al. do not explicitly disclose an apparatus wherein the surface emitting laser comprises layers of GaAs, AlGaAs, InGaAs and GaN.

47. Jain discloses a surface-emitting laser comprising layers of GaAs, AlGaAs, InGaAs (see Fig. 1).

48. Watanabe et al. disclose a surface-emitting laser comprising layers of GaN, AlGaAs, InGaAs (column 2, lines 7-11).

49. It would have been obvious to further modify the apparatus of Quate et al., such that it incorporated layers of GaAs, AlGaAs, InGaAs and GaN. One would have been motivated to make such a modification for the purpose of employing assemblies to provide multiple laser beam outputs as taught by Jain (column 1, lines 7-10). Additionally, Watanabe et al. teach that GaN is desirable as a layer because its rigidity is comparable to that of diamond (column 6, lines 6-8) and is therefore suitable as a support layer.

Conclusion

50. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

51. U.S. Patent 5,912,913 to Kondow et al. – discloses a surface emitting laser with detector (also discloses layering consisting of GaAs, AlAs, GaInNAs, etc.)

52. U.S. Patent 5,068,868 to Deppe et al. and U.S. Patent 5, 115,441 to Kopf et al. – disclose layering for surface emitting lasers.

53. U.S. Patent 6,201,226 to Shimada et al.

54. U.S. Patent 6,333,497 to Shimada et al.

55. U.S. Patent 6,376,833 to Shimada et al.

56. U.S. Patent 6,408,122 to Shimada et al.

57. U.S. Patent 6,408,123 to Kuroda et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305 3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Courtney Thomas

January 10, 2003

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